2017-18

QUALITY COTROL TEST REPORTS

Name of the Client: **Executive Engineer,** Byatarayanapura Division, BBMP, Bangalore.

Agency: **M/s S.M.L.P Construction & Asphalt,** Bangalore.

Name of the Work: Package 3 Improvements of roads and drains providing amenities construction of RO water plant Bangalore one center providing sodium vapour lights sign boards in ward no 9, 10 and 11 Byatarayanapura division as per annexure go no UDD 217 SFC 2016 dated 28.05.2016 works sl no for ward no 9, 33 to 34 ward no 10, 35 to 38 ward no 11, 39 to 48, BBMP, Bangalore.

PROJECT MANAGEMENT CONSULTANT

M/S. CIVIL QUALITY CONSULTANTS & ENGINEERS

(Buildings Geo-Tech & Road Materials Testing Laboratory)
An ISO 9001: 2008 Certified Company

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JAS-ANZ
ISO 9001:2000 CERTIFIED

Job No.: CQCE/BBMP/SMLPCA/2017-18

Date: 02.02.2018

TEST REPORT

CLIENT	:	**Executive Engineer,** Byatarayanapura Division, BBMP, Bangalore.
AGENCY	:	**M/s S.M.L.P Construction & Asphalt,** Bangalore.
NAME OF THE WORK	:	Package 3 Improvements of roads and drains providing amenities construction of RO water plant Bangalore one center providing sodium vapour lights sign boards in ward no 9, 10 and 11 Byatarayanapura division as per annexure go no UDD 217 SFC 2016 dated 28.05.2016 works sl no for ward no 9, 33 to 34 ward no 10, 35 to 38 ward no 11, 39 to 48, BBMP, Bangalore.
SAMPLE ID	:	Cement
SAMPLES SUPPLIED BY	:	AGENCY

The results of the tests conducted on the cement sample are as follows:

Sl.No	Descriptions	Test Method as per IS	Test Result	Requirements as per IS: 12269-1987
1	a) Initial Setting Time	IS-4031 (Part -5)	130 Minutes	Not Less than 30 Minutes
	b) Final Setting Time	IS-4031 (Part -5)	410 Minutes	Not More than 600 Minutes
2	Soundness	IS-4031 (Part 3) by the Le-Chatelier method	1 mm	Not more than 10 mm
3	Standard Consistency	IS-4031 (Part -4)	29.00 %	-

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Job No.: CQCE/BBMP/SMLPCA/2017-18 Date : 02.02.2018

TEST REPORT ON FINE AGGREGATES (SAND)
IS 383-1970 (RA- 2002)

Client : **Executive Engineer,** Byatarayanapura Division, BBMP, Bangalore.

Agency : **Sri. V Devanand,** Contractor, Bangalore.

Name of Work : Package 3 Improvements of roads and drains providing amenities construction of RO water plant Bangalore one center providing sodium vapour lights sign boards in ward no 9, 10 and 11 Byatarayanapura division as per annexure go no UDD 217 SFC 2016 dated 28.05.2016 works sl no for ward no 9, 33 to 34 ward no 10, 35 to 38 ward no 11, 39 to 48, BBMP, Bangalore.

Date of Testing : 02.02.2018

Material : Sand

Total Wt. of Aggregates in gms **1000**

Is Sieve Size in mm	Weight Retained (gm)	Retained Weight in %	Cumulative Retained Weight in %	Cumulative Weight Passing in %	Spec.Limits For Zone-II
10	0	0	0	100	100
4.75	91	9.10	9.10	90.9	90-100
2.36	137	13.70	22.80	77.2	75-100
1.18	148	14.80	37.60	62.4	55-90
600 Micron	187	18.70	56.30	43.7	35-59
300 Micron	167	16.70	73.00	27.0	8-30
150 Micron	195	19.50	92.50	7.5	0-10

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Job No.: CQCE/BBMP/SMLPCA/2017-18 Date : 02.02.2018

TEST REPORT ON COARSE AGGREGATES
IS 383-1970 (RA- 2002)

Client : **Executive Engineer,** Byatarayanapura Division, BBMP, Bangalore.

Agency : **Sri. V Devanand,** Contractor, Bangalore.

Name of Work : Package 3 Improvements of roads and drains providing amenities construction of RO water plant Bangalore one center providing sodium vapour lights sign boards in ward no 9, 10 and 11 Byatarayanapura division as per annexure go no UDD 217 SFC 2016 dated 28.05.2016 works sl no for ward no 9, 33 to 34 ward no 10, 35 to 38 ward no 11, 39 to 48, BBMP, Bangalore.

Date of Testing : 02.02.2018

Material : Sand

Total Wt. of Aggregates in gms **15000**

Is Sieve Size in mm	Weight Retained (gm)	Retained Weight in %	Cumulative Retained Weight in %	Cumulative Weight Passing in %	Spec.Limits
80	0	0	0	100	100
40	157	1.05	1.05	98.95	95-100
20	8614	57.43	58.47	41.53	30-70
10	3317	22.11	80.59	19.41	10-35
4.75	2396	15.97	96.56	3.44	0-5

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Job No.: CQCE/BBMP/SMLPCA/2017-18 Date : 02.02.2018

TEST REPORT ON COARSE AGGREGATES
IS 383-1970 (RA- 2002)

Client : **Executive Engineer,** Byatarayanapura Division, BBMP, Bangalore.

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Date of Testing : 02.02.2018

Material : Sand

Total Wt. of Aggregates in gms= **5000**

Is Sieve Size in mm	Weight Retained (gm)	Retained Weight in %	Cumulative Retained Weight in %	Cumulative Weight Passing in %	Spec.Limits
40	0	0	0	100	100
20	82	1.6	1.6	98.4	95-100
10	2647	52.9	54.6	45.4	25-55
4.75	1865	37.3	91.9	8.1	0-10

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Job No.: CQCE/BBMP/SMLPCA/2017-18 Date: 03.02.2018

TEST RESULTS OF PHYSICAL PROPERTIES OF REINFORCEMENT STEEL

Client : **Executive Engineer,** Byatarayanapura Division, BBMP, Bangalore.

Agency : **M/s S.M.L.P Construction & Asphalt,** Bangalore.

Name of Work : Package 3 Improvements of roads and drains providing amenities construction of RO water plant Bangalore one center providing sodium vapour lights sign boards in ward no 9, 10 and 11 Byatarayanapura division as per annexure go no UDD 217 SFC 2016 dated 28.05.2016 works sl no for ward no 9, 33 to 34 ward no 10, 35 to 38 ward no 11, 39 to 48, BBMP, Bangalore.

Sample Identification : 8mm,10mm,12mm Fe 500 TMT Bars

Technical Reference : IS 1786:2008, IS 1608:2005, IS 1599:1985 (Reaffirmed 2006)

Date of test : 03.02.2018

S.No	Brand	Nominal size (dia in mm)	Mass per metre (kg/metre)	TENSILE STRENGTH		
				0.20 % proof stress/ yield stress ($N/mm^{2)}$	Tensile strength ($N/mm^{2)}$	Elongation, percent on gauge length
1	Fe 500	8	0.39	534	543	13.5
2	Fe 500	10	0.62	548	556	14
3	Fe 500	12	0.88	559	568	14.5
4	Fe 501	16	1.59	575	584	16

Remarks:

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Job No.:CQCE/BBMP/SMLPCA/2017-18 Date : 03.02.2018

TEST REPORT ON SOLID CONCRETE BLOCKS

Client : **Executive Engineer,** Byatarayanapura Division, BBMP, Bangalore.

Agency : **M/s S.M.L.P Construction & Asphalt,** Bangalore.

Name of the Work : Package 3 Improvements of roads and drains providing amenities construction of RO water plant Bangalore one center providing sodium vapour lights sign boards in ward no 9, 10 and 11 Byatarayanapura division as per annexure go no UDD 217 SFC 2016 dated 28.05.2016 works sl no for ward no 9, 33 to 34 ward no 10, 35 to 38 ward no 11, 39 to 48, BBMP, Bangalore.

Date of Testing : 03.02.2018

Size of Blocks : 400mm x 200mm x 200mm

Cross Sectional Area : 80000 mm^2

Technical Reference : IS: 2185 (Part 1) - 2005

No. of Blocks Tested : 04

Sl.No.	Block ID	Wt. in Kg	Failure load (KN)	Compressive strength (N/mm^2)	Requirement as per IS 2185 (Part 1) - 2005
1	Block 1	37.2	268.6	3.36	Minimum required Compressive Strength of Individual Units 3.20 N/mm^2
2	Block 2	38.1	275.1	3.44	
3	Block 3	37.9	293.4	3.67	
4	Block 4	37.5	275.5	3.44	

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Job No.: CQCE/BBMP/SMLPCA/2017-18 Date: 03.02.2018

TEST REPORT

CLIENT	:	**Executive Engineer,** Byatarayanapura Division, BBMP, Bangalore.
AGENCY	:	**M/s S.M.L.P Construction & Asphalt,** Bangalore.
NAME OF THE WORK	:	Package 3 Improvements of roads and drains providing amenities construction of RO water plant Bangalore one center providing sodium vapour lights sign boards in ward no 9, 10 and 11 Byatarayanapura division as per annexure go no UDD 217 SFC 2016 dated 28.05.2016 works sl no for ward no 9, 33 to 34 ward no 10, 35 to 38 ward no 11, 39 to 48, BBMP, Bangalore.
Type of the test	:	Physical tests on Paver Blocks
Samples supplied by	:	Agency

The results of the tests conducted on the Paver Blocks sample are as follows:

1. THICKNESS:

Sl. No	Identification	Thickness, mm	Average thickness, mm
1	01	60.25	60.20
2	02	60.15	

2. COMPRESSIVE STRENGTH:

Sl. No	Identification	Load in Kilo-Newton	Cross sectional area, mm^2	Compressive strength N/mm^2
1	01	686.3	24,200	28.36
2	02	682.4	24,200	28.20

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Job No.: CQCE/BBMP/SMLPCA/2017-18

16.02.2018

TEST REPORT ON COMPRESSIVE STRENGTH OF CONCRETE CUBES

Client	:**Executive Engineer,** Byatarayanapura Division, BBMP, Bangalore.
Agency	: **M/s S.M.L.P Construction & Asphalt,** Bangalore.
Name of the work	: Package 3 Improvements of roads and drains providing amenities construction of RO water plant Bangalore one center providing sodium vapour lights sign boards in ward no 9, 10 and 11 Byatarayanapura division as per annexure go no UDD 217 SFC 2016 dated 28.05.2016 works sl no for ward no 9, 33 to 34 ward no 10, 35 to 38 ward no 11, 39 to 48, BBMP, Bangalore.
Sample ID	: Cement Concrete
Size of cubes	: 150mmx150mmx150mm
Cross Sectional Area	: 22500 mm^2
Technical Reference	: IS: 516-1959 (Reaffirmed 2008)
Grade of Concrete	: M_{15}
Compressive Strength as on	: 7th day

Sl.No.	Date of casting	Date of testing	Weight of cube (Kg)	Failure load (KN)	Compressive strength (N/mm^2)
1	09.02.2018	16.02.2018	8.151	259.8	11.55
2	09.02.2018	16.02.2018	8.143	267.4	11.88
3	09.02.2018	16.02.2018	8.138	273.6	12.16

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Job No.: CQCE/BBMP/SMLPCA/2017-18 09.03.2018

TEST REPORT ON COMPRESSIVE STRENGTH OF CONCRETE CUBES

Client	:**Executive Engineer,** Byatarayanapura Division, BBMP, Bangalore.
Agency	: **M/s S.M.L.P Construction & Asphalt,** Bangalore.
Name of the work	: Package 3 Improvements of roads and drains providing amenities construction of RO water plant Bangalore one center providing sodium vapour lights sign boards in ward no 9, 10 and 11 Byatarayanapura division as per annexure go no UDD 217 SFC 2016 dated 28.05.2016 works sl no for ward no 9, 33 to 34 ward no 10, 35 to 38 ward no 11, 39 to 48, BBMP, Bangalore.
Sample ID	: Cement Concrete
Size of cubes	: 150mmx150mmx150mm
Cross Sectional Area	: 22500 mm^2
Technical Reference	: IS: 516-1959 (Reaffirmed 2008)
Grade of Concrete	: M_{15}
Compressive Strength as on	: 28th day

Sl.No.	Date of casting	Date of testing	Weight of cube (Kg)	Failure load (KN)	Compressive strength (N/mm^2)
1	09.02.2018	09.03.2018	8.187	371.5	16.51
2	09.02.2018	09.03.2018	8.169	368.4	16.37
3	09.02.2018	09.03.2018	8.172	382.9	17.02

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Job No.: CQCE/BBMP/SMLPCA/2017-18 19.02.2018

TEST REPORT ON COMPRESSIVE STRENGTH OF CONCRETE CUBES

Client	: **Executive Engineer,** Byatarayanapura Division, BBMP, Bangalore.
Agency	: **M/s S.M.L.P Construction & Asphalt,** Bangalore.
Name of the work	: Package 3 Improvements of roads and drains providing amenities construction of RO water plant Bangalore one center providing sodium vapour lights sign boards in ward no 9, 10 and 11 Byatarayanapura division as per annexure go no UDD 217 SFC 2016 dated 28.05.2016 works sl no for ward no 9, 33 to 34 ward no 10, 35 to 38 ward no 11, 39 to 48, BBMP, Bangalore.
Sample ID	: Cement Concrete
Size of cubes	: 150mmx150mmx150mm
Cross Sectional Area	: 22500 mm^2
Technical Reference	: IS: 516-1959 (Reaffirmed 2008)
Grade of Concrete	: M_{20}
Compressive Strength as on	: 7th day

Sl.No.	Date of casting	Date of testing	Weight of cube (Kg)	Failure load (KN)	Compressive strength (N/mm^2)
1	12.02.2018	19.02.2018	8.167	322.5	14.33
2	12.02.2018	19.02.2018	8.151	353.4	15.71
3	12.02.2018	19.02.2018	8.174	342.8	15.24

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Job No.: CQCE/BBMP/SMLPCA/2017-18 12.03.2018

TEST REPORT ON COMPRESSIVE STRENGTH OF CONCRETE CUBES

Client : **Executive Engineer,** Byatarayanapura Division, BBMP, Bangalore.

Agency : **M/s S.M.L.P Construction & Asphalt,** Bangalore.

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Sample ID : Cement Concrete

Size of cubes : 150mmx150mmx150mm

Cross Sectional Area : 22500 mm^2

Technical Reference : IS: 516-1959 (Reaffirmed 2008)

Grade of Concrete : M_{20}

Compressive Strength as on : 28th day

Sl.No.	Date of casting	Date of testing	Weight of cube (Kg)	Failure load (KN)	Compressive strength (N/mm^2)
1	12.02.2018	12.03.2018	8.241	502.3	22.32
2	12.02.2018	12.03.2018	8.237	498.3	22.15
3	12.02.2018	12.03.2018	8.264	537.4	23.88

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Job No.: CQCE/BBMP/SMLPCA/2017-18 20.02.2018

TEST REPORT ON COMPRESSIVE STRENGTH OF CONCRETE CUBES

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Sample ID : Cement Concrete

Size of cubes : 150mmx150mmx150mm

Cross Sectional Area : 22500 mm^2

Technical Reference : IS: 516-1959 (Reaffirmed 2008)

Grade of Concrete : M_{20}

Compressive Strength as on : 7th day

Sl.No.	Date of casting	Date of testing	Weight of cube (Kg)	Failure load (KN)	Compressive strength (N/mm^2)
1	13.02.2018	20.02.2018	8.135	362.5	16.11
2	13.02.2018	20.02.2018	8.167	358.4	15.93
3	13.02.2018	20.02.2018	8.174	379.8	16.88

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Job No.: CQCE/BBMP/SMLPCA/2017-18 13.03.2018

TEST REPORT ON COMPRESSIVE STRENGTH OF CONCRETE CUBES

Client	: **Executive Engineer,** Byatarayanapura Division, BBMP, Bangalore.
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Sample ID	: Cement Concrete
Size of cubes	: 150mmx150mmx150mm
Cross Sectional Area	: 22500 mm^2
Technical Reference	: IS: 516-1959 (Reaffirmed 2008)
Grade of Concrete	: M_{20}
Compressive Strength as on	: 28th day

Sl.No.	Date of casting	Date of testing	Weight of cube (Kg)	Failure load (KN)	Compressive strength (N/mm^2)
1	13.02.2018	13.03.2018	8.258	524.3	23.30
2	13.02.2018	13.03.2018	8.269	512.6	22.78
3	13.02.2018	13.03.2018	8.284	500.8	22.26

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Job No.: CQCE/BBMP/SMLPCA/2017-18 21.02.2018

TEST REPORT ON COMPRESSIVE STRENGTH OF CONCRETE CUBES

Client	: **Executive Engineer,** Byatarayanapura Division, BBMP, Bangalore.
Agency	: **M/s S.M.L.P Construction & Asphalt,** Bangalore.
Name of the work	: Package 3 Improvements of roads and drains providing amenities construction of RO water plant Bangalore one center providing sodium vapour lights sign boards in ward no 9, 10 and 11 Byatarayanapura division as per annexure go no UDD 217 SFC 2016 dated 28.05.2016 works sl no for ward no 9, 33 to 34 ward no 10, 35 to 38 ward no 11, 39 to 48, BBMP, Bangalore.
Sample ID	: Cement Concrete
Size of cubes	: 150mmx150mmx150mm
Cross Sectional Area	: 22500 mm^2
Technical Reference	: IS: 516-1959 (Reaffirmed 2008)
Grade of Concrete	: M_{20}
Compressive Strength as on	: 7th day

Sl.No.	Date of casting	Date of testing	Weight of cube (Kg)	Failure load (KN)	Compressive strength (N/mm^2)
1	14.02.2018	21.02.2018	8.163	368.4	16.37
2	14.02.2018	21.02.2018	8.179	356.5	15.84
3	14.02.2018	21.02.2018	8.153	335.1	14.89

Note:

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2. The results indicated above are based on the tests carried out on the samples received in the laboratory.
3. Any Query regarding the report must be reported within 15 days from the date of testing.

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Authorised Signatory

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Job No.: CQCE/BBMP/SMLPCA/2017-18 14.03.2018

TEST REPORT ON COMPRESSIVE STRENGTH OF CONCRETE CUBES

Client : **Executive Engineer,** Byatarayanapura Division, BBMP, Bangalore.

Agency : **M/s S.M.L.P Construction & Asphalt,** Bangalore.

Name of the work : Package 3 Improvements of roads and drains providing amenities construction of RO water plant Bangalore one center providing sodium vapour lights sign boards in ward no 9, 10 and 11 Byatarayanapura division as per annexure go no UDD 217 SFC 2016 dated 28.05.2016 works sl no for ward no 9, 33 to 34 ward no 10, 35 to 38 ward no 11, 39 to 48, BBMP, Bangalore.

Sample ID : Cement Concrete

Size of cubes : 150mmx150mmx150mm

Cross Sectional Area : 22500 mm^2

Technical Reference : IS: 516-1959 (Reaffirmed 2008)

Grade of Concrete : M_{20}

Compressive Strength as on : 28th day

Sl.No.	Date of casting	Date of testing	Weight of cube (Kg)	Failure load (KN)	Compressive strength (N/mm^2)
1	14.02.2018	14.03.2018	8.265	537.6	23.89
2	14.02.2018	14.03.2018	8.241	521.4	23.17
3	14.02.2018	14.03.2018	8.267	496.8	22.08

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CQCE/BBMP/SMLPCA/2017-18

Date: 26.02.2018

KERB STONE (CORE) TEST REPORT

: **Executive Engineer,** Byatarayanapura Division, BBMP, Bangalore.

: **M/s S.M.L.P Construction & Asphalt,** Bangalore.

f Work : Package 3 Improvements of roads and drains providing amenities construction of RO water plant Bangalore one center providing sodium vapour lights sign boards in ward no 9, 10 and 11 Byatarayanapura division as per annexure go no UDD 217 SFC 2016 dated 28.05.2016 works sl no for ward no 9, 33 to 34 ward no 10, 35 to 38 ward no 11, 39 to 48, BBMP, Bangalore.

mple Tested : 03

Testing : 26.02.2018

cal Reference : IS:516-1959 (Reaffirmed 1999), SP-24:1983.

f Concrete : M_{15}

Dia of Core D (mm)	Height of Core H (mm)	Core Wt (Kg)	Density of Core (kg / m^3)	H / D	Correction factor (Based on H/D)	Failure Load (kN)	Core Strength (N/mm^2)	Correction Factor for the Dia. (Strength of the Core x 1.08)	Corrected Cylinder Compressive Strength (N/mm^2)	Equivalent Cube Compressive Strength (N/mm^2)
50.00	72.00	0.336	2376.71	1.44	0.960	28.90	14.72	15.90	15.26	19.08
50.00	76.00	0.357	2392.35	1.52	0.960	27.60	14.06	15.18	14.57	18.22
50.00	74.00	0.346	2381.30	1.48	0.960	29.40	14.97	16.17	15.52	19.41

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esults indicated above are based on the tests carried out on the samples received in the laboratory.
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b No.: CQCE/BBMP/SMLPCA/2017-18 Date : 02.03.2018

GRADATION FOR WMM
MORTH TABLE-400-11

lient :**Executive Engineer,** Byatarayanapura Division, BBMP, Bangalore.

gency : **M/s S.M.L.P Construction & Asphalt,** Bangalore.

ame of Work : Package 3 Improvements of roads and drains providing amenities construction of RO water plant Bangalore one center providing sodium vapour lights sign boards in ward no 9, 10 and 11 Byatarayanapura division as per annexure go no UDD 217 SFC 2016 dated 28.05.2016 works sl no for ward no 9, 33 to 34 ward no 10, 35 to 38 ward no 11, 39 to 48, BBMP, Bangalore.

Date of Testing : 02.03.2018

Material Type : Wet Mix Macadam

Oven Dry Wt (gm): **10000**

Is Sieve Size in mm	Weight Retained (gm)	Cumulative Weight Retained (gm)	Cumulative % of Retained	Cumulative % of Passing	Spec.Limits
53	0	0	0	100	100
45	238	238	2.4	97.6	95-100
22.4	2564	2802	28.0	72.0	60-80
11.2	2548	5350	53.5	46.5	40-60
4.75	1869	7219	72.2	27.8	25-40
2.36	1163	8382	83.8	16.2	15-30
0.600	658	9040	90.4	9.6	8-22
0.075	520	9560	95.6	4.4	0-8

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No.: CQCE/BBMP/SMLPCA/2017-18 Date :02.03.2018

GRADATION FOR WMM
MORTH TABLE-400-11

Client :**Executive Engineer,** Byatarayanapura Division, BBMP, Bangalore.

Agency : **M/s S.M.L.P Construction & Asphalt,** Bangalore.

Name of Work : Package 3 Improvements of roads and drains providing amenities construction of RO water plant Bangalore one center providing sodium vapour lights sign boards in ward no 9, 10 and 11 Byatarayanapura division as per annexure go no UDD 217 SFC 2016 dated 28.05.2016 works sl no for ward no 9, 33 to 34 ward no 10, 35 to 38 ward no 11, 39 to 48, BBMP, Bangalore.

Date of Testing :02.03.2018

Material Type : Wet Mix Macadam

Oven Dry Wt (gm): **10000**

Is Sieve Size in mm	Weight Retained (gm)	Cumulative Weight Retained (gm)	Cumulative % of Retained	Cumulative % of Passing	Spec.Limits
53	0	0	0	100	100
45	255	255	2.6	97.5	95-100
22.4	2536	2791	27.9	72.1	60-80
11.2	2584	5375	53.8	46.3	40-60
4.75	1846	7221	72.2	27.8	25-40
2.36	1152	8373	83.7	16.3	15-30
0.600	654	9027	90.3	9.7	8-22
0.075	535	9562	95.6	4.4	0-8

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No: CQCE/BBMP/SMLPCA/2017-18 **Date:** 02.03.2018

Aggregate Impact Value

IS: 2386 Part IV

	Executive Engineer, Byatarayanapura Division, BBMP, Bangalore..
	M/s S.M.L.P Construction & Asphalt, Bangalore.
Name of the Work	Package 3 Improvements of roads and drains providing amenities construction of RO water plant Bangalore one center providing sodium vapour lights sign boards in ward no 9, 10 and 11 Byatarayanapura division as per annexure go no UDD 217 SFC 2016 dated 28.05.2016 works sl no for ward no 9, 33 to 34 ward no 10, 35 to 38 ward no 11, 39 to 48, BBMP, Bangalore.
Type of Mix	Wet Mix Macadam
Date of Testing	02.03.2018

Sl No.	Details	Trial No. 1	Trial No. 2	Trial No. 3	Average
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	375	377	379	
2	Weight of agregate passing 2.36 mm sieve after the test = W_2 g	82	84	86	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	293	293	293	
4	Aggregate Impact value = percent fines 100* (W_2/W_1)%	21.87	22.28	22.69	22.28

Comments:

→ Maximum allowable Aggregate Impact value for Wet mix Macadam is 30%

Note:

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02.03.2018

No.:CQCE/BBMP/SMLPCA/2017-18

DETERMINATION OF FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

ient	**Executive Engineer,** Byatarayanapura Division, BBMP, Bangalore.
ency	**M/s S.M.L.P Construction & Asphalt,** Bangalore.
ame of Work	Package 3 Improvements of roads and drains providing amenities construction of RO water plant Bangalore one center providing sodium vapour lights sign boards in ward no 9 10 and 11 Byatarayanapura division as per annexure go no UDD 217 SFC 2016 dated 28.05.2016 works sl no for ward no 9 33 to 34 ward no 10 35 to 38 ward no 11 39 to 48, BBMP, Bangalore.
echnical Reference	IS 2386(Part 1) 1963 (RA 2011)
ype of Mix	Wet Mix Macadam
ample ID	WMM Layer
ate of Testing	02.03.2018

Result : Flakiness Index = **11.85%**

Elongation Index = **13.36%**

Result : Combined Flakiness & Elongation index **25.21%**

Comments:

Maximum allowable Flakiness & Elongation Index for Wet Mix Macadam is 30%

Note:

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CQCE/BBMP/SMLPCA/2017-18 Date : 02.03.2018

ATTERBERG LIMITS TEST FOR WMM
MORTH TABLE-400-11

: Executive Engineer, **Byatarayanapura Division, BBMP, Bangalore.**

: M/s S.M.L.P Construction & Asphalt, Bangalore.

e of Work : Package 3 Improvements of roads and drains providing amenities construction of RO water plant Bangalore one center providing sodium vapour lights sign boards in ward no 9 10 and 11 Byatarayanapura division as per annexure go no UDD 217 SFC 2016 dated 28.05.2016 works sl no for ward no 9 33 to 34 ward no 10 35 to 38 ward no 11 39 to 48, BBMP, Bangalore.

e of Testing : 02.03.2018

rial Type : Wet Mix Macadam

per MORTH Table 400-13

Sl. No.	Particulars	Test Results	Standards as per Specifications
1	Liquid Limit	23.50	-
2	Plasticity Index, %	Non Plastic	6.0% Maximum.

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CQCE/BBMP/SMLPCA/2017-18 Date : 02.03.2018

ATTERBERG LIMITS TEST FOR WMM
MORTH TABLE-400-11

: Executive Engineer, **Byatarayanapura Division, BBMP, Bangalore.**

: M/s S.M.L.P Construction & Asphalt, Bangalore.

e of Work : Package 3 Improvements of roads and drains providing amenities construction of RO water plant Bangalore one center providing sodium vapour lights sign boards in ward no 9 10 and 11 Byatarayanapura division as per annexure go no UDD 217 SFC 2016 dated 28.05.2016 works sl no for ward no 9 33 to 34 ward no 10 35 to 38 ward no 11 39 to 48, BBMP, Bangalore.

e of Testing : 02.03.2018

terial Type : Wet Mix Macadam

per MORTH Table 400-13

Sl. No.	Particulars	Test Results	Standards as per Specifications
1	Liquid Limit	22.00	-
2	Plasticity Index, %	Non Plastic	6.0% Maximum.

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Job No.: CQCE/BBMP/SMLPCA/2017-18

Date: 07.03.2018

TEST REPORT

Client	:	**Executive Engineer,** Byatarayanapura Division, BBMP, Bangalore.
Agency	:	**M/s S.M.L.P Construction & Asphalt,** Bangalore.
Name of the work	:	Package 3 Improvements of roads and drains providing amenities construction of RO water plant Bangalore one center providing sodium vapour lights sign boards in ward no 9, 10 and 11 Byatarayanapura division as per annexure go no UDD 217 SFC 2016 dated 28.05.2016 works sl no for ward no 9, 33 to 34 ward no 10, 35 to 38 ward no 11, 39 to 48, BBMP, Bangalore.
Source of location	:	Hot mix Plant, Bangalore
Date of testing	:	07.03.2018

The results of the tests conducted on the bitumen sample using for Bituminous Concrete

Sl. No	Description	Test Result	Requirement as per IS:73:2013
1	Penetration at 25 ^{0}C, 1/10 mm	68	60 to 70
2	Softening point, ^{0}C	49	Min. 45
3	Ductility at 27^{0}C, cm	100 >	Min. 50
4	Flash Point, ^{0}C	302	Min. 220

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No.: CQCE/BBMP/SMLPCA/2017-18 07.03.2018

Aggregate Gradation Test

IS : 2386 Part I

lient	**Executive Engineer,** Byatarayanapura Division, BBMP, Bangalore.
gency	**M/s S.M.L.P Construction & Asphalt,** Bangalore.
Name of theWork	Package 3 Improvements of roads and drains providing amenities construction of RO water plant Bangalore one center providing sodium vapour lights sign boards in ward no 9, 10 and 11 Byatarayanapura division as per annexure go no UDD 217 SFC 2016 dated 28.05.2016 works sl no for ward no 9, 33 to 34 ward no 10, 35 to 38 ward no 11, 39 to 48, BBMP, Bangalore.
Sample I / D	Hot Mix Plant, Bangalore
Type of Mix	Bituminous Concrete
Date of Testing	07.03.2018

Total Weight of Sample: **5000** gm

SIEVE SIZE, mm	Weight Retained, gm	% Retained	Cummulative % Retained	% Passing	JOBMIX Gradation as per MORTH	Remarks
19	0	0	0	100	100	Gradation satisfies Bituminous concrete Grade-II specification as per MORTH
13.2	528	10.56	10.56	89.44	79 - 100	
9.5	495	9.90	20.46	79.54	70 - 88	
4.75	710	14.20	34.66	65.34	53 - 71	
2.36	548	10.96	45.62	54.38	42 - 58	
1.18	485	9.70	55.32	44.68	34 - 48	
0.600	630	12.60	67.92	32.08	26 - 38	
0.300	528	10.56	78.48	21.52	18 - 28	
0.150	356	7.12	85.60	14.40	12 - 20	
0.075	410	8.20	93.80	6.20	4 - 10	

Total Weight of Sample: **5000** gm

SIEVE SIZE, mm	Weight Retained, gm	% Retained	Cummulative % Retained	% Passing	JOBMIX Gradation as per MORTH	Remarks
19	0	0	0	100	100	Gradation satisfies Bituminous concrete Grade-II specification as per MORTH
13.2	658	13.16	13.16	86.84	79 - 100	
9.5	459	9.18	22.34	77.66	70 - 88	
4.75	730	14.60	36.94	63.06	53 - 71	
2.36	538	10.76	47.70	52.30	42 - 58	
1.18	460	9.20	56.90	43.10	34 - 48	
0.600	615	12.30	69.20	30.80	26 - 38	
0.300	539	10.78	79.98	20.02	18 - 28	
0.150	364	7.28	87.26	12.74	12 - 20	
0.075	420	8.40	95.66	4.34	4 - 10	

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Job No.: CQCE/BBMP/SMLPCA/2017-18 Date: 07.03.2018

Aggregate Impact Value

IS: 2386 Part IV

Client	**Executive Engineer,** Byatarayanapura Division, BBMP, Bangalore.
Agency	**M/s S.M.L.P Construction & Asphalt**, Bangalore.
Name of the Work	Package 3 Improvements of roads and drains providing amenities construction of RO water plant Bangalore one center providing sodium vapour lights sign boards in ward no 9, 10 and 11 Byatarayanapura division as per annexure go no UDD 217 SFC 2016 dated 28.05.2016 works sl no for ward no 9, 33 to 34 ward no 10, 35 to 38 ward no 11, 39 to 48, BBMP, Bangalore.
Source / Location	Hot Mix Plant, Bangalore
Type of Mix	Bituminous Concrete
Date of Testing	07.03.2018

Sl No.	Details	Trial No.		Average
		1	2	
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	376	380	
2	Weight of agregate passing 2.36 mm sieve after the test = W_2 g	83	85	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	293	295	
4	Aggregate Impact value = percent fines 100* (W_2/W_1) percent	22.07	22.37	**22.22**

Comments:

→ Maximum allowable Aggregate Impact value for Bituminous Concrete is 24%

Note:

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Job No.: CQCE/BBMP/SMLPCA/2017-18 07.03.2018

DETERMINATION OF FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

Client	**Executive Engineer,** Byatarayanapura Division, BBMP, Bangalore.
Agency	**M/s S.M.L.P Construction & Asphalt,** Bangalore.
Name of Work	Package 3 Improvements of roads and drains providing amenities construction of RO water plant Bangalore one center providing sodium vapour lights sign boards in ward no 9, 10 and 11 Byatarayanapura division as per annexure go no UDD 217 SFC 2016 dated 28.05.2016 works sl no for ward no 9, 33 to 34 ward no 10, 35 to 38 ward no 11, 39 to 48, BBMP, Bangalore.
Technical Reference	IS 2386(Part 1) 1963 (RA 2007)
Type of Mix	Bituminous Concrete
Date of Testing	07.03.2018

Result : Flakiness Index = **11.98%**

Elongation Index = **13.68%**

Result : Combined Flakiness & Elongation index **25.66%**

Comments:

→ Maximum allowable Flakiness & Elongation Index for Bituminous Concrete is 30%

Note:

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Job No.: CQCE/BBMP/SMLPCA/2017-18 07.03.2018

Specific Gravity And Water Absorption Test
IS: 2386 Part III

Client	**Executive Engineer,** Byatarayanapura Division, BBMP, Bangalore.
Agency	**M/s S.M.L.P Construction & Asphalt,** Bangalore.
Name of the Work	Package 3 Improvements of roads and drains providing amenities construction of RO water plant Bangalore one center providing sodium vapour lights sign boards in ward no 9, 10 and 11 Byatarayanapura division as per annexure go no UDD 217 SFC 2016 dated 28.05.2016 works sl no for ward no 9, 33 to 34 ward no 10, 35 to 38 ward no 11, 39 to 48, BBMP, Bangalore.
Type of Mix	Bituminous Concrete
Date of Testing	07.03.2018

Sl. No.	Details	Notation	Test Number			Mean Value
			Test 1	Test 2	Test 3	
1	Weight of aggregate suspended in water with the basket	W_1 g	2021	2023	2025	
2	Weight of basket suspended in water	W_2 g	755	755	755	
3	Weight of saturated aggregate in water	$(W_1 - W_2) = W_s$ g	1266	1268	1270	
4	Weight of saturated surface dry aggregate in air	W_3 g	2017	2019	2021	
5	Weight of water equal to the volume of the aggregate	$(W_3 - W_S)$ g	751	751	751	
6	Weight of oven dried aggregate	W_4 g	2009	2010	2011	
7	Specific Gravity	$W_4/(W_3-W_S)$	2.675	2.676	2.678	2.676
8	Apparent Specific gravity	$W_4/(W_4-W_S)$	2.704	2.709	2.714	2.709
9	Water Absorption	$((W_3-W_4)*100)/W_4$	0.40%	0.45%	0.50%	0.45%

Comments:

→ Maximum allowable Aggregate Water absorption value for Bituminous Concrete is 2.0%

Note:

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⇒ The results indicated above are based on the tests carried out on the samples received in the laboratory
⇒ Any Query regarding the report must be reported within 15 days from the date of testing.

AE, W-10

For CIVIL QUALITY CONSULTANTS & ENGINEERS

Authorised Signatory

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CIVIL QUALITY CONSULTANTS & ENGINEERS

(Buildings Geo-Tech & Highway Materials Testing Laboratory)
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Job No.: CQCE/BBMP/SMLPCA/2017-18 Date: 08.03.2018

TEST REPORT ON STABILITY OF MIX

Client	:	**Executive Engineer,** Byatarayanapura Division, BBMP, Bangalore.
Agency	:	**M/s S.M.L.P Construction & Asphalt,** Bangalore.
Name of the Work	:	Package 3 Improvements of roads and drains providing amenities construction of RO water plant Bangalore one center providing sodium vapour lights sign boards in ward no 9, 10 and 11 Byatarayanapura division as per annexure go no UDD 217 SFC 2016 dated 28.05.2016 works sl no for ward no 9, 33 to 34 ward no 10, 35 to 38 ward no 11, 39 to 48, BBMP, Bangalore.
Source of location	:	Hot mix Plant, Bangalore
Type of Mix	:	Bituminous Concrete
Date of Testing	:	08.03.2018

The results of the tests conducted on the bituminous concrete mix sample are as follows:

Sl. No	Description	Test Result 1	Test Result 2	Requirement as per MORTH (Table 500-19)
1	Marshal Stability, Kn	10.52	9.68	9 Kn (min)
2	Marshal flow, mm	2.36	3.61	2 – 4
3	Percent air voids in Mineral Aggregate	13.54	14.36	13 – 15
4	Voids in Compacted Mix	4.21	5.63	3 – 6
5	Percent Voids filled with Bitumen	72.16	73.52	65 - 75
6	Density, g/cc	2.26	2.27	--

Note:

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BITUMEN CONTENT AND GRADATION DETERMINATION OF BITUMINOUS CONCRETE

CLIENT	**Executive Engineer,** Byatarayanapura Division, BBMP, Bangalore.
AGENCY	**M/s S.M.L.P Construction & Asphalt,** Bangalore.
NAME OF THE WORK	Package 3 Improvements of roads and drains providing amenities construction of RO water plant Bangalore one center providing sodium vapour lights sign boards in ward no 9, 10 and 11 Byatarayanapura division as per annexure go no UDD 217 SFC 2016 dated 28.05.2016 works sl no for ward no 9, 33 to 34 ward no 10, 35 to 38 ward no 11, 39 to 48, BBMP, Bangalore.
DATE OF TESTING	08.03.2018

BITUMEN CONTENT DETERMINATION

Description	Sample 1	Sample 2
1. Weight of Mixture before Test, g	500	500
2. Weight of Mixture after Test, g	470.5	469
3. Weight of Asphalt and Mineral matter Extracted, g	29.5	31
4. Weight of Mineral Matter, g.	-	-
5. Weight of Ash, g	-	-
6. Weight of Bitumen Extracted, g. (corrected)	29.5	31
7. Bitumen content in %	5.90	6.20
8. Average	**6.05**	

GRADATION AFTER EXTRACTION

TABLE - 1

SIEVE SIZE	Percent Passing, %		JOBMIX
mm	Sample 1	Sample 2	Gradation
19	100.0	100.0	100
13.2	95.4	96.4	79-100
9.5	83.7	84.9	70-88
4.75	58.3	59.1	53-71
2.36	53.4	52.5	42-58
1.18	42.5	43.6	34-48
0.6	31.8	32.8	26-38
0.3	24.9	25.1	18-28
0.15	16.9	17.5	12-20
0.075	5.8	6.4	4-10

Note:

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